

What is claimed is:

1. A method for manufacturing a semiconductor device having a conductive path extending from an upper surface of an insulating layer of silicon dioxide on a semiconductor substrate to a conductive member embedded in said insulating layer, comprising the steps of:

forming on said insulating film an etching mask defining an etched hole for said conductive path within a permissible placement error;

performing a selective etching process to said insulating layer to remove a region of said insulating layer not covered by said etching mask by using a reactive ion etching unit for introducing into a reaction chamber reactive gas of CHF_3/CO components, respectively flowing at a flow ratio of about 15/85; and

filling said hole formed by the etching process with a conductive material for said conductive path.

2. A manufacturing method according to Claim 1, wherein when the pressure of said reaction chamber is not less than 100mTorr and the high-frequency power of said etching unit is 1600W, a placement error of said etching mask is $0.04\mu\text{m}$.

3. A manufacturing method according to Claim 2, wherein the flow rates of CHF_3 and CO are respectively about 30sccm and about 170sccm.

4. A manufacturing method according to Claim 2, wherein when the flow rate of said reactive gas to said reaction chamber is not less than about 300sccm and the pressure of said reaction chamber is not less than 200mTorr,

the permissible placement error of said etching mask is $0.1\mu\text{m}$.

5. A manufacturing method according to Claim 5, wherein the flow rates of CHF_3 and CO of said reactive gas supplied to said reaction chamber are about 45sccm and about 255sccm.

6. A method for manufacturing a semiconductor device having a conductive path extending from an upper surface of an insulating layer of silicon dioxide on a semiconductor substrate to a conductive member embedded in said insulating layer, comprising the steps of:

forming on the upper surface of said insulating layer an etching mask defining an etched hole for said conductive path extending to said conductive member within a permissible placement error;

performing a selective etching process to said insulating layer by using a reactive gas to remove a region of said insulating layer not covered by said etching mask;

depositing a polymeric product by a polymeric film generating action of said reactive gas into an etched groove resulting from the misalignment of said etching mask; and

filling said etched hole formed by said etching process with a conductive material for said conductive path.

7. A manufacturing method according to Claim 6, wherein said reaction gas is a mixed gas of CHF_3 and CO.

8. A manufacturing method according to Claim 7, wherein the flow rate of said mixed gas is about 300sccm.

9. A manufacturing method according to Claim 7, wherein the pressure of said mixed gas in said reaction chamber is not less than 200mTorr.